

**Department of Public Instruction
Strategic Information Technology Plan
March 2005**



Wisconsin Department of Public Instruction
Elizabeth Burmaster, State Superintendent
Madison, Wisconsin

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Introduction

Planning Strategy

This is an update to the Department of Public Instruction's strategic information technology (IT) plan. The plan articulates a vision for IT, key strategic directions and specific projects. It continues to use a framework of four architectures, technology, applications, data, and organization, although the agency recognizes the interconnection of the architectures. Information security and privacy is of prime concern in the business program units. No security architecture independently exists because these topics are integrated within the other four architectures. The plan was developed in-house under the leadership of the Chief Information Officer.

Department Mission

The DPI mission supports the Governor's goal of government efficiency, children, and education through the New Wisconsin Promise.

In July 2001 Superintendent Elizabeth Burmaster took office:

The State Superintendent's *New Wisconsin Promise*:

Leadership • Advocacy • Accountability

To meet the challenges ahead of leadership, advocacy, and accountability for our public schools and libraries, I have taken a step to align the DPI structure with the agenda of the people of Wisconsin upon which I was elected:

- The people of Wisconsin want public education that ensures that every child has the opportunity of a quality education through small class sizes, quality teachers and administrators, and greater community and parental involvement.
- The people of Wisconsin understand that the future of our democracy depends on the success of the public schools and libraries to diminish social stratification through equal access to knowledge and opportunity. Narrowing the achievement gap between children of poverty and their peers must be our top priority.
- The people of Wisconsin understand that reading is the fundamental skill that separates those who succeed from those who struggle.
- The people of Wisconsin understand that educational accountability consists of more than just producing good test takers. They want the next generation to have the skills necessary to be productive citizens who contribute to their communities.

I trust the people of Wisconsin, and they trusted me to fulfill this agenda. Through leadership, advocacy, and accountability, we can and will accomplish these goals.

—State Superintendent Elizabeth Burmaster

Key Strategic Priorities

Narrowing the achievement gap

- Reading
- Early Learning Opportunities
- Educator Quality
- Parent/Community Involvement
- Career and Technical Education

The top priority for the Department of Public Instruction is the federally mandated “No Child Left Behind.” This effort is key to the delivery of the agency’s strategic priorities.

Quality Education for Every Child

IT Strategic Plan Directions

The strategic plan was reviewed by the staff responsible for developing the 2004 plan. Project plans were updated and new projects were documented.

The strategic IT plan supports the organizing concepts and strategic priorities of the DPI.

The vision for information technology at DPI is that it is fully integrated into all business functions so that it supports the work of all staff, in meeting the mission and goals of the *New Wisconsin Promise* and key strategic priorities by providing easy access to reliable information and facilitating fact-driven, collaborative decision-making for the agency, school districts, libraries, other government entities and the public. The DPI IT strategic plan directions are:

- Positioning technology and data as agency resources rather than specific program resources
- Supporting cross-agency work and ease of internal communication and information sharing
- Providing all DPI staff the technological resources necessary for their work
- Reducing data reporting burden to Wisconsin’s school and libraries by collecting data once and using it many times
- Integrating forms, data collection and data management
- Creating flexible, easy access to data and other information for staff and the public
- Providing technology that enables DPI to be a high-performance organization focusing on results, service quality, and customer satisfaction
- Enlisting each program area in DPI for data clean-up in partnership with the State Superintendent’s Education Data Advisory Committee
- Participating cooperatively with the Division of Enterprise Technology on its enterprise initiatives to provide all State of Wisconsin IT services efficiently and cost effectively

This IT strategy plan focuses on maximizing enterprise resources that have been developed by making them more readily available across the agency and to the general public. A significant tactic intended to reflect this is ensuring that all DPI sites: GEF 3, Reference and Loan Library, the Wisconsin School for the Deaf, the Wisconsin Center for the Blind and Visually Impaired, and the Wisconsin Equal Opportunity Program (WEOP) offices are included in the infrastructure plan. Thus, when desktop computers are deployed, operating systems and software are changed or upgraded these sites are included in cost estimates and equipment inventories. The only exception to this is instructional technology at the two residential schools. Instructional technology is addressed in separate plans for the schools.

Recent Progress (2004- 2005)

Significant progress has been made toward these goals. Specific projects that have been completed or are underway:

- Consolidation of multiple Department Active Directories is being planned.
- Upgrade email and scheduling software from Microsoft Outlook/Exchange 5.5 to the Enterprise Oracle Collaboration Suite is in progress.
- Implementation of a redesigned agency's web presence is planned for summer 2005.
- Progress has been made on the Teacher License re-engineering project. The scanning phase of the project was implemented. A completely new on-line application was approved in the 05-07 Budget and design is being planned in conjunction with DET.
- Wisconsin Libraries accomplishments, See Appendix A.
- DPI was awarded a grant for the planning of the Data Warehouse by spring 2006.
- DPI commissioned a study by the Council of Chief State School Officers of the core business processes and the status of the IT systems that support those processes. This Decision Support Architecture Consortium(DSAC) report forms the roadmap for development of new IT systems along with potential changes to the various Architectures.

Architectures

Applications Architecture Definition

Applications architecture consists of all the business systems that automate the activities of the organization.

Current Applications Architecture

Production applications at the agency are client/server or Internet based. Most data is stored in the Oracle DBMS. Some client/server applications use PowerSoft tools as the GUI interface. Internet applications use the browser as the interface with ASP, ASP.NET and JAVA being the development tools. There are also several batch production processes. The batch-invoked software is written in COBOL and Screen I/O. While the major data is stored in Oracle, interim files in these COBOL batch processes are stored in indexed and flat files. A Citrix server allows DPI staff to access applications and data using the Internet.

Proposed Applications Architecture

The impact of the DET SIS effort will be monitored for changes to the Applications Architecture.

Data Architecture Definition

Data Architecture refers to the organization or design of data. It provides a clear definition of how the data is structured, collected, shared, maintained, and stored from both the IT and business community perspectives. DPI will evaluate the 'Enterprise Services Bus' offered by DOA/DET as it relates to the Data Architecture.

Current Data Architecture

The DPI data architecture is LAN and Internet based. Major enterprise data resides in the Oracle DBMS on production file servers. Individual program areas also develop databases specific to their own program in MS Access. Files produced in batch processes are stored in indexed and flat files on the LAN. Information is also collected and published on the Internet using UNIX (DEG), NT, MS 2000, Sybase EAServer, WebSphere, and Oracle.

Current data architecture includes the following hardware processing platforms and data management systems:

On the GEF 3 Local Area Network (LAN) and Internet

- XP, MS 2003, Novell, Citrix, WebSphere
- Oracle Warehouse Servers for collecting and publishing information locally and globally
- Statistical Analysis System (SAS) files on file servers
- Clarion and Excel files on file servers

Proposed Data Architecture

The current data architecture will continue to be developed and maintained. The major new development in Data Architecture is the creation of a number of interrelated items, which will maximize the value of the enterprise database and provide easier access of the data to our users. These related projects are the following:

- WINSS—Wisconsin Information Network for Successful Schools
- The Wisconsin School Finance Data Warehouse on the Web
- The Internet Data Collection
- No Child Left Behind
- WSLS—Wisconsin Student Locator System
- ISES—Individual Student Enrollment System

The data model represents the data architecture where each data entity DPI needs to collect and its relationship to the other entities. All current and new data projects are contributing to the implementation of this data model. This data model:

- represents each data entity only once;
- shows relationships between data entities;
- provides a framework for data collection that will eliminate duplicate collections;
- provides a framework for further development of the agency enterprise database

The No Child Left Behind project will influence the agency's data definition, collection and reporting on Wisconsin schools. In FY05 the Wisconsin Student Locator System (WSLS) assigned each of Wisconsin's 880,000 students a unique number. The Individual Student Enrollment System (ISES) will collect data and replace existing aggregate data reports.

The DSAC study recommended consolidation of data elements and collections, the development of a Data Dictionary and ultimately a consolidated Data Warehouse. These efforts are underway.

Organization Architecture Definition

Organization architecture refers to the human and financial resources an organization devotes to Information Technology and how they are deployed and employed to support the organization's mission and key goals.

Current Organizational Architecture

There are three teams in the area of Information Technology: the Application Development Team, the Technical Services Team, and the Library, Statistical Information Team. There is also an IT group at the Reference and Loan Library (See Appendix A).

IT Administration

The director responsible for agency IT and the Library and Statistical Information Center now serves as Chief Information Officer (CIO) for DPI. This person has responsibility for looking at information technology in its broadest sense, from an agency perspective. The CIO has responsibility for developing a biennial strategic IT plan and ensuring its implementation. The Chief Information Officer is assisted in overall administration of the IT program by the team leaders for Applications Development and Technical Services.

The Chief Information Officer/IT Director reports to the Division Administrator for Libraries, Technology, and Community Learning.

Technical Services Team

This team plans, implements and maintains all technical support for the agency information technology. This includes operating a help desk, managing all agency IT assets, trouble shooting any technical problems and generally maintaining the integrity of the entire agency infrastructure. Responsibilities include:

- the development, support, and maintenance of the Local Area Network (LAN)
- the development, support, and maintenance of the Wide Area Network (WAN)
- the development, support, and maintenance of the department WEB site
- the management and regular back-up of files and databases on servers
- the installation of new/replacement desktops and laptops
- the development and growth of the agency Web server environment
- the management and maintenance of an agency Intranet
- IT training and help desk support for the agency

In FY05, the IT staff at the Schools for the Visual and Hearing impaired were brought under the supervision of the central office IT Team.

Applications Development Team

This team is responsible for development and maintenance of all agency applications. It manages and maintains the integrity of the agency enterprise database, a complex Oracle DBMS. Responsibilities include:

- working closely with user groups to develop, improve and maintain applications for critical agency functions such as teacher licensing, state aids distribution and food commodity distribution
- development of all new applications in the LAN and Internet environments
- maintenance of active applications
- assistance to agency staff in the use of applications and management of the agency enterprise database
- working with the Data and Forms Coordinator to develop and maintain the agency data dictionary and the agency data model
- working with the technical services team to develop data collection via the Internet.

In addition to permanent staff, contract analysts and programmers are hired to complete specific projects for which permanent staff are not available.

Library and Statistical Information Center Team

This team is responsible for providing research information and data related to all aspects of the work of the agency. Responsibilities include:

- operation of the agency professional library which provides a small permanent book and journal collection
- extensive online information search services
- interlibrary loan services
- managing the teleconference activities of the agency
- managing five major data collections for the agency
- completing data reporting to the National Center for Education Statistics
- providing current statistical information on PK-12 education in Wisconsin
- leading the cross agency Data Access Contact group and providing data access training
- creating analysis of education statistical information on topics of current interest
- Developing geographic information data presentations for the agency and serving as liaison to the state GIS council.
- Planning for customer support of the WSLS/ISES applications upon termination of the vendor contract.

Proposed Organization Architecture

The DET SIS initiative will change the Organizational Architecture. The DPI plans to fully participate and support this effort.

The DSAC report recommends new relationships with the Cooperative Educational Service Agencies for delivery and support of IT systems to K-12 school districts. This will be further investigated in FY06.

Technology Architecture Definition

The technology architecture refers to the policies, procedures, hardware and software that an organization uses to develop and operate computer systems and communications networks for the transmission of data, voice and video.

Current Technology Architecture

Information about the current technology architecture is provided in the AIM-IT framework.

Proposed Technology Architecture

The technology architecture will support an agency-level perspective. Technology upgrades are designed to meet agency-wide capacity and performance requirements, using proven and current technology, to support the needs and missions of all teams and work units. The Technology Architecture will be impacted by DET consolidation effort.

The DPI technology architecture will continue to be characterized by:

- Five LANs linked to each other; one in GEF 3 and one each for Reference and Loan Library, Wisconsin Center for the Blind and Visually Impaired (WCBVI) in Janesville; Wisconsin School for the Deaf (WSD) in Delavan; and the Wisconsin Equal Opportunities Program (WEOP)/Urban Initiative Office in Milwaukee
- Three microcomputer platforms—Windows XP, Windows 2000, and Macintosh
- Multiple server back-ups, redundancy and reliability
- Intelligent work stations for every employee
- Connectivity to schools, libraries and Internet
- Videoconference and similar capabilities
- Flexibility, e.g., the ability to easily connect to specialty peripherals

Physical WAN

The Madison offices of DPI, as well as Reference and Loan Library (RLL), the Wisconsin Equal Opportunities Program (WEOP) office in Milwaukee, the Center for the Blind and Visually Impaired (WCBVI) in Janesville, and Wisconsin School for the Deaf (WSD) in Delavan are now all able to connect to the WiscNet via T1 lines.

A firewall physically separates the public access servers in GEF 3 from the internal network. The design of the WAN is all remote sites (RLL, WEOP, WCBVI, and WSD) connect via the DPI router. This means all communication within DPI (GEF 3 and the remote sites) takes place behind the firewall.

Desktop Hardware Environment

Technical Services continues to replace older desktop machines with new models. Our goal is a four-year replacement cycle and enhanced configurations and functionality. Additionally, we are working to limit the number of different machine models which we need to support and maintain.

Staff who travel a great deal and have need for computer access while on the road have laptops systems. Configurations purchased are based on the needs of the users and job functions. Additional laptops are provided to program areas to be loaned to staff for temporary work on location or for presentation purposes.

Macintosh computers that remain are either used for publication functions or instructional functions at the residential schools, as indicated in the agency standards migration plan.

Desktop Peripherals

Program areas typically have purchased projection units so their staff can use them for conferences and workshops. These teams often share these resources with other teams. Scanners and Fax's have typically also been purchased by program areas but are increasingly recognized as sharable resources within the agency. LAN printers are purchased by IT and are a shareable resource.

Staff Training

Training for functional and support staff in agency software is ongoing. Internal training on basic office suite applications is provided by agency staff. State sponsored and private training has also been offered and attended on advanced office suite training and specialized applications used in the agency.

Technology Requirements

The driving force for changes to DPI's computing infrastructure is to provide the environment capable of supporting applications deemed necessary to achieve DPI's mission in the most cost-effective manner, and in a manner consistent with agency and enterprise IT standards. Business expectations require that all workstations attached to the DPI LAN will be able to communicate with "exterior" LANs, the Internet, the agency Intranet etc. In addition, workstations will be able to access the GEF 3 LAN remotely and PK-12 schools, libraries and the public will have access to the DPI Web site. Direct connections will be maintained with the Wisconsin's DOA mainframe, and LANs at WSD, WCBVI, RLL, and Milwaukee WEOP.

Blackberry service and support for management and key staff will be required in FY06.

The DET SIS initiative will significantly alter the Technology Architecture. The DPI will actively participate in this planning. The DPI support requirements from DET will include a Secured Portal, ESB development in the Data Warehouse, increased emphasis on the statewide ID system, planning for single sign-on for K-12 students and staff, and integration of the Teacher Certification and Licensing system.

Information Technology Projects, FY05

O = Ongoing Maintenance

N = New Project

ROI = Return On Investment for DET

Project Title	O	N	Area	ROI
BadgerLink: Access to Full Text Databases	✓		RLL	
BadgerLink: Digitizing Library Resources	✓		RLL	
State Portal Interface			RLL	
BadgerLink: Statewide network for linking library systems	✓		RLL	
Circulation for the Reference and Loan Library, DPI Library, DWD, DFHS and PSC libraries	✓		RLL	
Replace AV Booking System			RLL	
Wisconsin Document Depository Program	✓		RLL	
WISCAT Online	✓		RLL	
Electronic Forms Implementation	✓		LSIC	
No Child Left Behind (WSLS/ISES)		✓	Application	
Teacher Licensing Re-Engineering		✓	Application	
Nutritional Commodity System	✓		Application	
Internet Data Collection	✓		Application	
Confidential Student Databases	✓		Application	
Data Dictionary	✓		Data	
Enhanced Data Access for Internal DPI Staff	✓		Data	
Wisconsin Information Network for Successful Schools—WINSS	✓		Data	
Wisconsin School Finance Database	✓		Data	
Agency Information Technology Training Plan	✓		Data	
Information Technology Delivery Systems Review	✓		Organization	
4-year Hardware Replacement Cycle	✓		Technology	
COOP/COG		✓	Technology	
Email/Scheduling Software Move to DET		✓	Technology	
Intranet	✓		Technology	
Data Warehouse		✓	Technology	
e-Grant Claim Submission System		✓	Application	
Public School Open Enrollment system		✓	Application	
Equalization Aid Calculation		✓	Application	
Collection of Tax Levy(w/DOR)		✓	Application	
e-Payments		✓	Application	
Database driven integrated Fax/eMail		✓	Technology	
Assessment- data from WSLS, on-line reporting		✓	Application	
Survey/Conference Management tool		✓	Technology	
Email Migration to DET		✓	Technology	

Appendix A: Wisconsin Libraries

BadgerLink

BadgerLink provides a portal for Wisconsin residents to full text information provided through statewide contracts and programs and to links to selected sources of information on the Web. This information is made available to library staff in all types of libraries and to students and other Wisconsin residents at home, in offices, in classrooms, and from other Wisconsin locations.

BadgerLink provides access to 11,000 full text magazine, newspaper, and reference book titles, biographies, primary historical documents, images, poems, essays, speeches, book reviews, video presentations and many other types of materials. There is information for all ages and in many subject areas. Subject areas emphasized are education, medicine and business.

Staff develops and manages vendor contracts for services, manage authentication strategies for access, develop and support a portal web site, provide and arrange for training, and provide technical support. Staff works with approximately 170 internet service providers and over 1,000 libraries to provide services.

Technical areas that need to be addressed in 2005-2007:

- Use of WAMS as an additional means of authentication for users that do not have Wisconsin based internet service providers or do not have library card access.
- Continued work with libraries to provide access through local automated systems or to put links on their sites.
- Use of Auto-Graphics CMS to better manage a database of website links that are featured on the BadgerLink portal.
- Potential placement of a link to BadgerLink on the state portal (Wisconsin.gov)

Digitization of Library Resources

Wisconsin libraries have collections of local and state information that are unique within Wisconsin and nationally. These collections could be put into machine-readable format and made available through the Web to library staff and users throughout the world. The Division plans to continue to allocate LSTA funding to assist Wisconsin public and state government libraries to digitize library materials so that they can be displayed on the Web. The Division plans to continue to work with the University of Wisconsin Digital Content Group and UW-Madison to carry out this project.

Division staff is also taking part in the statewide planning effort (Wisconsin Heritage Online (WHO)) and will participate in collection development, metadata standards, technical planning, publicity, funding, and other activities related to this program.

Technical areas that need to be addressed in 2005-2007:

- Award 6 or 7 grants using LSTA funds and continue to work with UW-Madison to scan materials, develop appropriate metadata according to national standards, and host the website with the materials as part of the Wisconsin collection.
- Use of Auto-Graphics CMS to develop and manage an inventory of statewide digitization website links.

Circulation System for the Reference and Loan Library and Other State Agencies

The Reference and Loan Library manages a circulation system/online catalog for its own collection and for other state agencies that want to participate. Currently, the DPI Library and Statistical Information Center, DWD, and PSC are participating. A number of state agency libraries have closed recently which has cut down on participation.

Technical areas that need to be addressed in 2005-2007:

- Address system stability and performance problems
- Determine if want to use Z39.50 standard protocol to link with WISCATILL interlibrary loan management system.

WISCAT Online and WISCAT Interlibrary Loan

The Reference and Loan Library provides Web access to a statewide library catalog of bibliographic records and holdings and a statewide interlibrary loan management system for Wisconsin libraries of all types, including public, academic, school, and special libraries. New web-based technology and new functionality for the statewide library catalog and interlibrary loan management system were procured using a RFP process in 2001 when two vendors were chosen to provide an integrated system. Planning is currently taking place to define what the next generation system will look like and to develop specifications for an additional RFP process which will take place in 2006.

The WISCAT database includes the holdings of 1,212 libraries and contains 6.97 million bibliographic records with over 34 million holdings. Library staff and patrons place and manage approximately 250,000 requests per year.

Staff manages vendor contracts, manages system configuration, and provides training and technical support for these systems. A major upgrade to the interlibrary loan management system took place in 2005 and annual upgrades are scheduled.

The automated systems utilize the following national standards:

- US/MARC Standard for the format and tags for bibliographic records
- Z39.50 Standard for the query of different databases
- ISO interlibrary loan standard defines the transfer of data between systems
- NCIP (NISO Circulation Interchange Protocol) for transfer of data between interlibrary loan management systems and circulation systems.

Technical areas that need to be addressed in 2005-2007:

- Expansion of patron-generated requests
- Management of authentication strategies
- Use of email request transmission for libraries not using the system
- Filtering of interlibrary loan requests by materials type and availability
- Use of ISO standard to integrate with other interlibrary loan management systems
- Evaluation of potential future technical scenarios
- Further integration with local automated systems to decrease transactions and staff workload

State Government Portal Work Through a Contract With DOA/DET

Reference and Loan Library staff has worked under contract with DOA/DET to provide services to the state portal project. Staff manages the subject directory through the state search engine and manages a related thesaurus for use by state agency staff to use in assigning Dublin Core subject metatags to web pages. Reference and Loan Library staff member serves on the Portal Governance Group and recently worked with a subcommittee to review search engine performance. The subcommittee issued a report with numerous recommendations for improvement. Overall, the Reference and Loan staff assists with portal operations by performing the following types of tasks:

- Respond to citizen requests for portal information
- Maintain the subject directory for the portal
- Maintain the thesaurus content
- Create and maintain Ultraseek CCE rules
- Maintain agency contract with MultiTES for thesaurus software
- Implement, maintain content and provide technical support and training for MultiTES thesaurus
- Maintain content of synonym and variant spellings list
- Work with Illinois State Library to develop multi-state topic tree
- Provide consultation and training to agency staff on metatagging
- Develop, implement, and maintain metadata strategy
- Discuss search engine configuration with DOA/DET staff

Technical areas that need to be addressed in 2005-2007:

- Discuss with DET staff and implement the recommendations of the PGG search engine improvement subcommittee

Preservation and Archiving of State Government Information

Reference and Loan Library staff manages the Wisconsin Document Depository Program and is responsible for collecting and distributing state government publications to Wisconsin depository libraries. Increasingly, state government publications are no longer available in print or audio-visual format and are instead placed on the Web where there is currently no way to archive them and make them available in the future to the public. The Reference and Loan Library subscribes to the OCLC Digital Archive software. This software allows staff to harvest Web pages, catalog them and create Dublin Core metadata, archive and preserve the machine readable page, and make it accessible to the public through the OCLC WorldCat

database and through WISCAT union catalog. During 2005, the Reference and Loan Library will conduct a pilot project to preserve information and will be working with the Wisconsin Historical Society and the Legislative Reference Bureau library staff.

Technical areas that need to be addressed in 2005-2007:

- Complete pilot project to determine if the Digital Archive software will meet our needs
- Review impact of DOA/DET purchase of Content Management Software on improvement of workflow and productivity
- Work with the Electronic Records Forum and SWAG to develop criteria for preserving web-based state documents
- Refine workflow and determine staffing and budget needs for an ongoing program
- Implement permanent project if feasible

Virtual Reference Service

The Reference and Loan Library takes part in two services that provide “virtual reference” services using chat and email software. Both are hosted by OCLC and use the QuestionPoint software.

Technical areas that need to be addressed in 2005-2007:

- Placement of links for users on the DPI page and the state portal page (Wisconsin.gov)
- Request LSTA funding for a statewide pilot of 24x7 virtual reference service for Wisconsin participating libraries.